
Magelona sacculata

A burrowing polychaete

Phylum: Annelida

Class: Polychaeta, Polychaeta incertae sedis

Order:

Family: Magelonidae

Description

Size: Individuals range in size from 20–30 mm in length and 0.7–1.5 mm in width with approximately 100 segments (Hartman 1961). The illustrated specimen (from Coos Bay) is 30 mm long with 50–80 segments and comprises the following description.

Color: Ivory, with paired dorsal lavender spots (Hartman 1961; Blake 2000). The purple color is due to hemerythrin-containing hemocytes, which are unique to magelonids (Ruppert et al. 2004).

General Morphology: Long, slender and threadlike body bearing extremely long palps anteriorly with a flattened or shovel-like anterior for burrowing (Blake and Ruff 2007).

Body: Body separated into thoracic, consisting of prostomium, peristomium and the first nine setigers, followed by a distinct abdominal region. First segment is a smooth ring and setiger nine is short (Figs. 1, 3). Lateral pouches present between setigers nine and 11 (species *sacculata*) (Blake 2000) (Figs. 1, 3). Body musculature is cross-striated (Ruppert et al. 2004).

Anterior: Prostomium transparent, flattened, shovel-shaped (Fauchald 1977) and often much wider than rest of body. Anterior tip rounded, with slight medial ridge (Fig 2). Prostomium widens posteriorly and has two strong muscles supporting it from below. Prostomium width can be equal to or greater than length (Jones 1963; Blake 2000), but this is not true for our specimens. Peristomium thicker and greater in length than setiger one (Blake 2000).

Trunk: Lateral pouches found be-

tween setigers 10–11 (although more commonly 9–10, Blake 2000) and irregularly along abdomen. These are lateral and open anteriorly (Fig. 3) (species *sacculata*, Blake 1975).

Posterior: Pygidium tapers and bears a pair of slender anal cirri (Hartman 1969) (Fig. 1a).

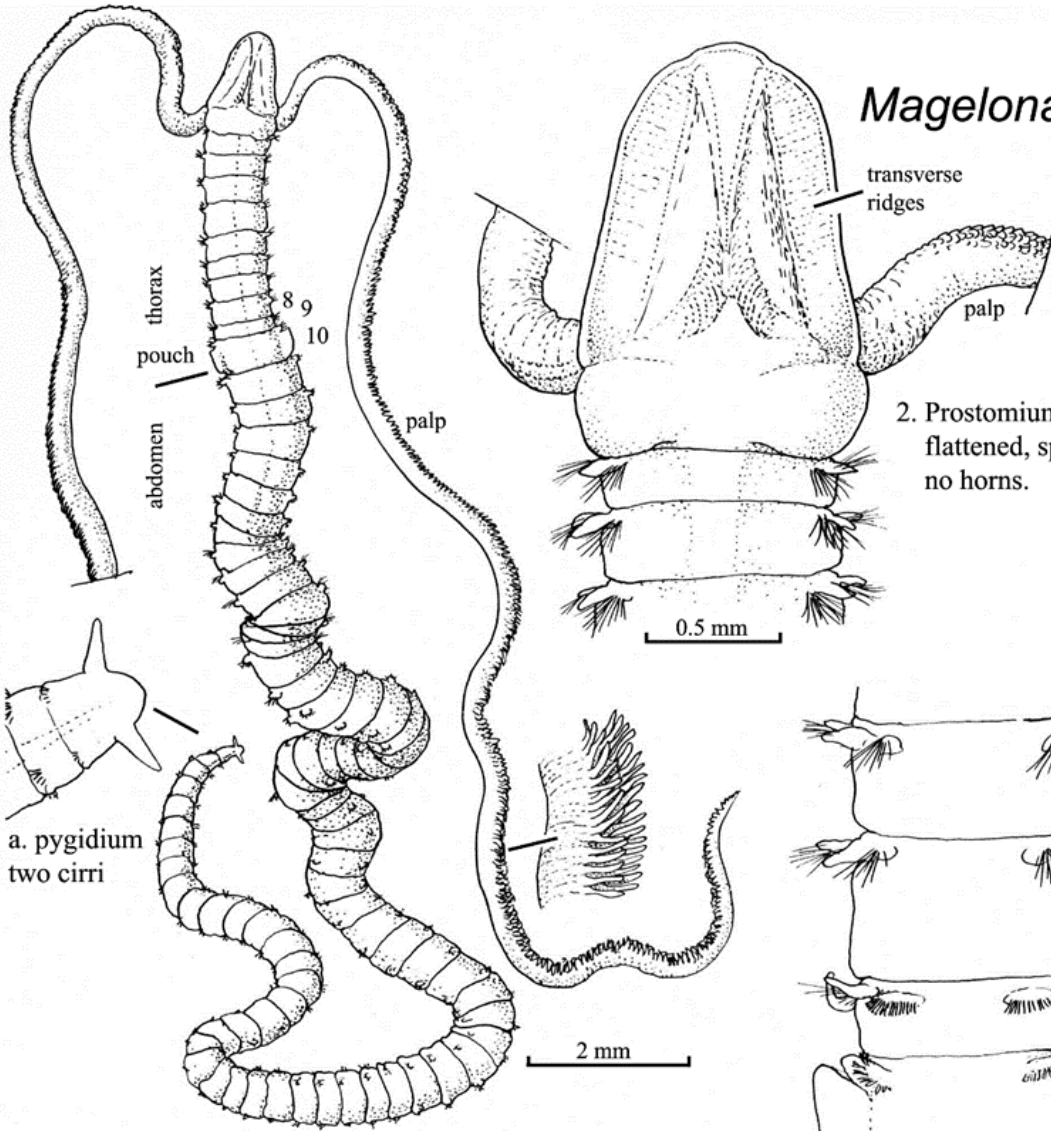
Parapodia: Begin on setiger one (segment two). First eight setigers have biramous parapodia, with pointed setae in both rami (Fig. 6). Thoracic setigers 1–8 biramous with noto- and neuropodia foliaceous and elevated. Thoracic notopodia bear dorsal medial lobe with lateral lamellae while neuropodia have a ventral lobe (Blake 2000). Setiger nine with specialized setae (unlike those of setigers 1–8) and conspicuous lateral lamellae. Abdominal parapodia have small dorsal and ventral medial lobes and broad, lateral lamellae where notch is produced as noto- and neuropodial lamellae almost overlap (Fig. 5).

Setae (chaetae): Several types of setae are observed: (1) limbate (simple, capillary, with flattened margin which can be pennoned and is found in both rami in setigers 1–9 and abdominal notopodia (Fig. 6), (2) crenulate setae (clubbed, like a molar), found as specialized setae on setiger nine (Jones 1963) (Figs. 4, 7), (3) mucronate (sharp tip and abruptly tapered) found as specialized setae, also on setiger nine (but not on these specimens, Fig. 8) and (4) hooded hooks (each with a large fang and two small teeth), of uniform size (species *sacculata*, Hartman and Reish 1950) found only abdominally (Blake 2000) (Fig. 9).

Eyes/Eyespots: None.

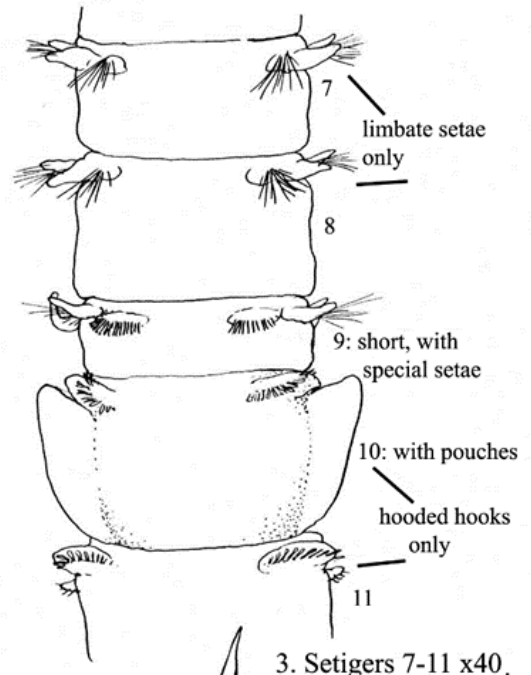
Anterior Appendages: No horns or

Magelona sacculata

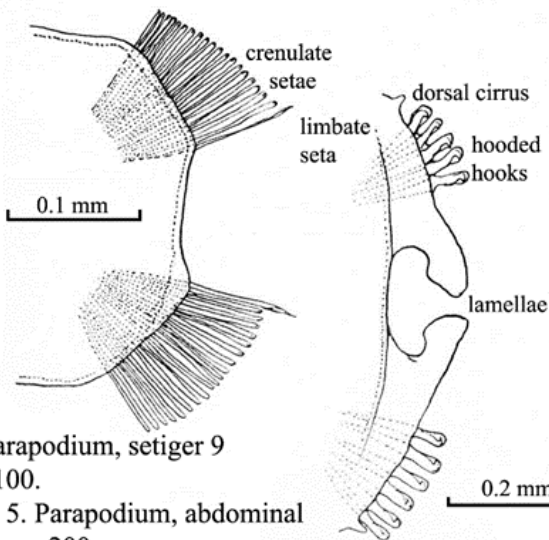


2. Prostomium (dorsal view) x40: flattened, spatulate, transparent; no horns.

1. *Magelona sacculata* (L:30mm) x12: obvious thorax and abdomen, long palps; no branchiae or genital spines; lateral pouches between setigers 10 and 11; setiger 9 short.



3. Setigers 7-11 x40.



4. Parapodium, setiger 9 x100.

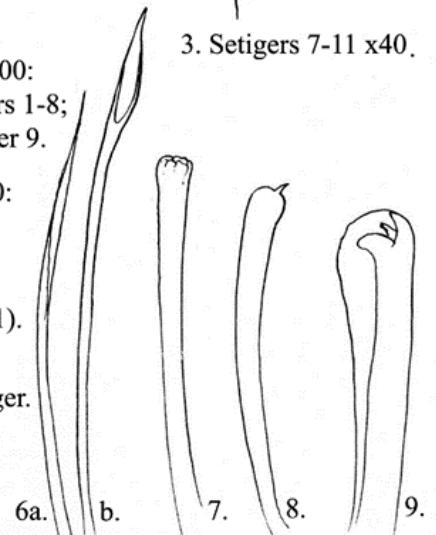
5. Parapodium, abdominal x200.

6. Limbate setae x300:
a. capillary, setigers 1-8;
b. pennoned, setiger 9.

7. Crenulate seta x600:
from setiger 9.

8. Mucronate seta
(from Hartman 1961).

9. Hooded hook x600:
from abdominal setiger.



appendages, but with a ventral pair of conspicuous, elongate papillate palps (family Magelonidae). Palps are long (extending to setiger 26), adhesive and coarsely papillated (Hartman 1961; Blake 2000). They are attached ventrally at the junction of peri- and prostomiums (Fauchald 1977).

Branchiae: None.

Burrow/Tube: Magelonids are good burrowers (see **Behavior**), but do not inhabit a permanent tube or burrow.

Pharynx: Bears proboscis which is smooth and globular when everted (Hartman 1961).

Genitalia:

Nephridia:

Possible Misidentifications

There are three other large, common families of the order Spionida. The Spionidae, a very numerous and diverse group is characterized by grooved palps. Unlike Magelonidae, they have palps which are not papillate, adhesive, or exceedingly long. Their prostomiums are not flattened and they often have eyes, nuchal tentacles and/or branchiae, where magelonids do not. Cirratulidae have long palps and long, filamentous gills, which are lacking in the Magelonidae. The Chaetopteridae, also a Spionida family, have very distinct body regions, thick spines on setiger four, and often have fan-like medial parapodia. Their tubes are parchment-like or annulated (Fauchald 1977).

Trochochaetidae and Longosomatidae (= Heterospionidae) are small, obscure spionid families each containing only one genus. Trochochaetidae have bodies divided into two regions, a large flattened prostomium with a pair of palps, a single occipital tentacle and two pairs of parapodia directed forward. Like the Magelonidae, they are not tube dwellers. Longoso-

matidae have short thoracic and very long abdominal setigers. They have a prostomium without appendages and a pair of palps as well as filiform branchiae on the thorax. They do not inhabit the intertidal zone. Poecilochaetidae are spionids with long, slender bodies. They have a small prostomium with a single antenna and palps and their parapodia have prominent dorsal and ventral cirri.

Magelona is one of three genera in the family Magelonidae where there are 70 described species (Clark et al. 2010). Members of the genus *Meredithia* (Hernández-Alcántara & Solis-Weiss, 2000) possess large hooded and curved spines in some abdominal setigers (Clark et al. 2010). The genus *Ocomagelona* (Aquirrezabalaga et al. 2001) is characterized by eight thoracic setigers (instead of nine) (Clark et al. 2010).

The characters which are used to differentiate members of the genus *Magelona* include the prostomium morphology (size and presence or absence of frontal horns), presence or absence of medial lobes on thoracic notopodia, position or presence of lateral pouches, modified setal morphology on setiger nine, morphology of abdominal hooded hooks, abdominal medial lamellae and the presence or absence and morphology of inter lamellae on abdominal parapodia (Blake and Ruff 2007). *Magelona sacculata* is unique in having large, lateral open pouches between setigers 10 and 11, uniform hooded hooks on the abdominal parapodia and mucronate or crenulate specialized setae on setiger nine.

Other species in the genus include: *Magelona pacifica* (Monro, 1933), seemingly a southern species, is unlikely to be found in Oregon (Hartman 1969). *Magelona cerae* (Hartman 1950; Hartman and Reish 1950) was found at depths of 37-73 m off Coos Bay forming beds in sand, but further reports of this species are lacking.

Individuals are up to 10 mm in length, the prostomium has slight, blunt horns at the corners. The thoracic notopodia have a dorsal cirrus which disappears by the ninth segment. Each of the abdominal hooded hooks has one large fang with a small tooth above it. *Magelona californica* (Hartman, 1944), although found in southern California, is considered a northeastern Pacific species by Hartman (1969). It has a rounded prostomium like that of *M. sacculata*, but it lacks lateral pouches and its abdomen is abruptly wider than the thorax (Hartman 1969). *Magelona pitelkai* (Hartman, 1944), has been reported from Coos Bay as well as Washington and British Columbia, but its identity has not been confirmed (Jones 1978). This is a large species with 54 segments reaching 35 mm in length. The prostomium has a truncate margin and the special setae on setiger nine have pennoned tips, not mucronate ones. *Magelona pitelkai* lacks lateral pouches and is the most common magelonid in central and northern California (Blake 1975). *Magelona pitelkai* can be distinguished from *M. sacculata* in that the former species has small, deeply embedded and modified hooks in addition to the larger hooks. *Magelona sacculata*, on the other hand has only one hook type (Blake 2000). *Magelona longicornis* (Johnson, 1901), (= *M. japonica* Okuda, 1937 (Jones 1971)) has prostomial horns, lateral parapodial lamellae in setigers 1–8, no modification on the ninth parapodium, bidentate hooded hooks (Jones 1971) and no lateral pouches. This species is the one most likely to be found in Puget Sound (Kozloff 1974). *Magelona berkeleyi* (Jones, 1971) has inconspicuous anterior prostomial horns, extended lateral lamellae on its parapodia and no lateral pouches. Like *M. sacculata*, it has tridentate hooded hooks,

but it has no specialized setae on the ninth setiger (Blake 2000). *Magelona berkeleyi* is reported from central California to Washington (Blake 2000).

Ecological Information

Range: Type locality is San Pedro Shelf, California (Hartman 1969). NE Pacific distribution ranges from British Columbia (Hobson and Banse 1981) to southern California (Hartman 1969).

Local Distribution: Oregon distribution, Yaquina Bay and Umpqua estuaries. Coos Bay sites include the inner bay and South Slough.

Habitat: Fine sands, silt (Blake 1975) and sandy mud in Coos Bay (South Slough). Builds poorly supported burrows with no distinct or permanent tube.

Salinity: Found at salinities of 30 in Coos Bay.

Temperature:

Tidal Level: More likely to be found subtidally than intertidally in Oregon. Occurs subtidal to 50 m in southern California (Hartman 1969; Blake 2000).

Associates:

Abundance: Considered rare from central California to Oregon, where *M. pitelkai* is more common (Blake and Ruff 2007). However, in Oregon it may be the most common magelonid.

Life-History Information

Reproduction: The development of *M. sacculata* is not known. Wilson (1982) described the development of three magelonid species from the southern coast of England including *Magelona allenii*, *M. filiformis* and *M. mirabilis*. Among these three species, which reproduce by broadcast spawning, oocyte diameters ranged from 100–150 µm in diameter with natural spawning speculated in late summer (August), near Plymouth, England (Wilson 1982; Blake 2006).

Larva: Magelonid larvae are pelagic. They are recognizable by long anterior larval tenta-

cles that coil (Wilson 1982; Crumrine 2001; Pernet et al. 2002), reaching lengths of or exceeding the larval body length. Magelonid larvae also have two bunches of long setae (four in each bunch, Wilson 1982) that arise from chetal sacs just below the larval tentacles. The three *Magelona* species with described development (Wilson 1982) developed into trochophore larvae after about a day. In these species, Wilson (1982) noted the elongation of the prototrochal region (= tentacles) and two eyes once larvae were three days old. An unidentified megalonid larva is commonly seen in plankton samples in Coos Bay which may be the larva of *M. cercae* (Crumrine 2001) or *M. sacculata*. (<http://invert-embryo.blogspot.com/2010/05/nechtochaete-larva-of-polychaete.html>).

Juvenile:

Longevity:

Growth Rate:

Food: A motile surface deposit feeder which chooses large particles of detritus and diatoms. Small crustaceans are captured on papillated surface of palps. A looping motion moves food up the palp and mucus may help final movement into mouth. Some suspension feeding may also take place.

Magelonid larvae feed on veligers (Fauchald and Jumars 1979, Johnson and Brink 1998).

Predators:

Behavior: *Megalona sacculata* is a good burrower which is aided by its shovel-like head.

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